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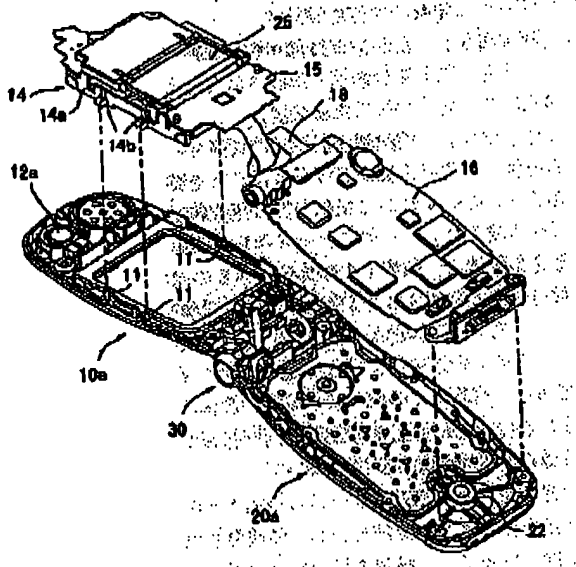
(54)【発明の名称】携帯無線装置

(57)【要約】
【課題】 筐体の成形煩雑化を招くことなく、基板や液晶表示部を一方の筐体内にしっかりと保持できる携帯無線装置を提供する。
【解決手段】 一方のケース10aの他方のケースに対向する面に、液晶表示部14を囲むように保持ピン11が一体成形され、液晶表示部14の周縁部に、保持ピン11の立設方向に対してほぼ平行に液晶表示部14を一方のケース10aへ組み付けることで保持ピン11と係合される被保持部14bが設けられた携帯無線装置。



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【特許請求の範囲】

【請求項1】 一対の筐体ケースからなり前記筐体ケース内に電子部品を保持する保持部材を装着する携帯無線装置において、

一方の前記筐体ケースは保持部材を保持する保持ピンが一体成形し、前記保持ピンの立設方向に対して、略平行に前記保持部材を前記筐体ケースへ組み付け、前記保持ピンと係合することにより保持することを特徴とする携帯無線装置。

【請求項2】 前記一方の筐体ケースが金属より形成されたことを特徴とする請求項1に記載の携帯無線装置。

【請求項3】 前記一方の筐体ケースがマグネシウムより形成されたことを特徴とする請求項1に記載の携帯無線装置。

【請求項4】 一対のケースからなる筐体内部に液晶表示部及び回路基板が装着された携帯無線装置において、

一方のケースの他方のケースに対向する面に前記液晶表示部を囲むように保持ピンが一体成形され、前記液晶表示部の周縁部に、前記保持ピンの立設方向に対してほぼ平行に前記液晶表示部を前記一方のケースへ組み付けることで前記保持ピンと係合された被保持部が設けられていることを特徴とする携帯無線装置。

【請求項5】 前記一方のケースが金属より形成されたことを特徴とする請求項4に記載の携帯無線装置。

【請求項6】 前記一方のケースがマグネシウムより形成されたことを特徴とする請求項4に記載の携帯無線装置。

【請求項7】 前記被保持部が前記保持ピンとの係合によって生じる弾性反発力により前記液晶表示部を前記一方のケースに係止したことを特徴とする請求項4～6のいずれかに記載の携帯無線装置。

【請求項8】 前記被保持部が前記保持ピンの外周の少なくとも一部を囲む形状に形成されたことを特徴とする請求項7に記載の携帯無線装置。

【請求項9】 前記液晶表示部の周縁部に、前記回路基板を係止する係止部が設けられたことを特徴とする請求項4～8のいずれかに記載の携帯無線装置。

【請求項10】 一対のケースからなる第1の筐体及び第2の筐体と、該第1の筐体及び第2の筐体を互いに回動可能に連結するヒンジ部とを備え、前記第1の筐体と第2の筐体とを前記ヒンジ部を中心に回動させることでそれら第1の筐体及び第2の筐体を折り畳むことが可能であり、前記第1の筐体及び第2の筐体の少なくともいずれかの内部に液晶表示部及び回路基板が装着された折り畳み式の携帯無線装置において、

一方のケースの他方のケースに対向する面に前記液晶表示部を囲むように保持ピンが一体成形され、前記液晶表示部の周縁部に、前記保持ピンの立設方向に対してほぼ平行に前記液晶表示部を前記一方のケースへ組み付けることで前記保持ピンと係合された被保持部が設けられていることを特徴とする折り畳み式の携帯無線装置。

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【請求項11】 前記一方のケースが金属より形成されたことを特徴とする請求項10に記載の折り畳み式の携帯無線装置。

【請求項12】 前記一方のケースがマグネシウムより形成されたことを特徴とする請求項10に記載の折り畳み式の携帯無線装置。

【請求項13】 前記被保持部が前記保持ピンとの係合によって生じる弾性反発力により前記液晶表示部を前記一方のケースに係止したことを特徴とする請求項10～12のいずれかに記載の折り畳み式の携帯無線装置。

【請求項14】 前記被保持部が前記保持ピンの外周の少なくとも一部を囲む形状に形成されたことを特徴とする請求項13に記載の携帯無線装置。

【請求項15】 前記液晶表示部の周縁部に、前記回路基板を係止する係止部が設けられたことを特徴とする請求項10～14のいずれかに記載の折り畳み式の携帯無線装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、液晶表示部を備えた携帯無線装置に関する。

【0002】

【従来の技術】近年、携帯電話機等の小型の携帯無線装置が各種開発されている。携帯電話機には、例えば図5に示すように、概略構成として、表ケース50aと裏ケース50bとで構成されるケース50内部に、ホルダ54、導光板55及び液晶ディスプレイ（LCD）56等で構成される液晶表示部と基板53とが備えられている。ホルダ54は、基板53側に突設したピン54aを基板53に設けた孔53aに嵌挿することで基板53に固定される。さらに、このホルダ54には、LCD56へのバックライトを導光させる導光板55を介してLCD56が固定保持される。基板53は、表ケース50aと裏ケース50bとを組み合わせてネジ止めした際に、ケース50内に固定される。

【0003】また、携帯無線装置として、筐体を上部及び下部に分割して折り畳み可能に構成し、送受信時の操作性を確保しつつポケットや鞄への収容を容易にしたものが開発されている。

【0004】

【発明が解決しようとする課題】従来の携帯無線装置は、表ケース50aと裏ケース50bとを組み合わせるまでは基板53及び液晶表示部が表ケース50a又は裏ケース50bに固定されなかった。したがって、製造工程において、例えば裏ケース50bを搬送しながらその裏ケース50bに基板53、液晶表示部及び他の構成部品を組み付けていく際に、裏ケース50b内で基板53や液晶表示部が正規の位置からずれてしまうことがあった。また、裏ケース50bをひっくり返して部品の組み

付けを行うことができなかった。また、折り畳み式の携帯無線装置の製造工程では、上部筐体の表ケースと下部筐体の表ケースとをヒンジ部を介して連結した状態で搬送しながらそれら表ケースに部品の組み付けが行われるが、上部筐体の表ケースと下部筐体の表ケースとをヒンジ部で折れ曲がった状態で連結した場合、搬送台上におけるそれら表ケースの安定性が悪く、基板や液晶表示部が正規の位置から特にずれやすくなる。また、筐体の強度向上等を目的として、筐体を金属で形成する場合があるが、その場合、液晶表示部の保持のために、係止爪等の複雑な形状のものを筐体に一体成形することが困難であった。本発明は、上記事情に鑑みてなされたものであって、その目的は、筐体の成形煩雑化を招くことなく、基板や液晶表示部を一方の筐体内にしっかりと保持できる携帯無線装置を提供することにある。

【0005】

【課題を解決するための手段】上記目的達成のため、本発明に係る請求項1に記載の携帯無線装置は、一対の筐体ケースからなり前記筐体ケース内に電子部品を保持する保持部材を装着する携帯無線装置において、一方の前記筐体ケースは保持部材を保持する保持ピンが一体成形し、前記保持ピンの立設方向に対して、略平行に前記保持部材を前記筐体ケースへ組み付け、前記保持ピンと係合することにより保持することを特徴とする。また、本発明に係る請求項4に記載の携帯無線装置は、一対のケースからなる筐体内部に液晶表示部が装着された携帯無線装置において、一方のケースの他方のケースに対向する面に前記液晶表示部を囲むように保持ピンが一体成形され、前記液晶表示部の周縁部に、前記保持ピンの立設方向に対してほぼ平行に前記液晶表示部を前記一方のケースへ組み付けることで前記保持ピンと係合された被保持部が設けられていることを特徴とする。この携帯無線装置では、一方のケースと他方のケースとを組み合わせる前から、液晶表示部を一方のケースに固定ないし仮固定できる。したがって、製造工程において、一方のケースを搬送しながらそのケースに液晶表示部、回路基板及び他の構成部品を組み付けていく際に、そのケース内で液晶表示部が正規の位置からずれることがない。また、被支持部が、保持ピンの立設方向に対してほぼ平行に液晶表示部を一方のケースへ組み付けることで保持ピンと係合されるような形状になっているので、液晶表示部の一方のケースへの組付作業を自動化し易い。さらに、液晶表示部を組み付けた状態でそのケースをひっくり返して他の部品の組み付けを行うことも可能になる。保持ピンの形態は限定されないが、円柱状のもの等を例示できる。このような保持ピンは容易に一方のケースに設けることができ、例えば一方のケースが金属等比較的成形が難しい材料より形成される場合も、保持ピンをその一方のケースに容易に設けることができる。

【0006】本発明に係る請求項2及び5に記載の携帯無線装置は、上記構成において、一方のケースが金属より形成されたことを特徴とする。本発明に係る請求項3及び6に記載の携帯無線装置は、上記構成において、一方のケースがマグネシウムより形成されたことを特徴とする。このような携帯無線装置によれば、筐体の強度を高めることで、携帯無線装置の耐久性を高めることができる。また、マグネシウムを用いることで、携帯無線装置の薄型化及び軽量化も実現できる。

【0007】本発明に係る請求項7に記載の携帯無線装置は、上記構成において、被保持部が保持ピンとの係合によって生じる弾性反発力により液晶表示部を一方のケースに係止したことを特徴とする。また、本発明に係る請求項8に記載の携帯無線装置は、上記構成において、被保持部が保持ピンの外周の少なくとも一部を囲む形状に形成されたことを特徴とする。このような携帯無線装置によれば、被保持部に弾性を持たせたことで、液晶表示部の一方のケースへの組み付けを容易に行えるとともに、一旦組み付けた液晶表示部がそのケースから外れたり、そのケース内で正規の位置からずれたりすることがなく、液晶表示部をそのケース内にしっかりと保持できる。

【0008】本発明に係る請求項9に記載の携帯無線装置は、上記構成において、液晶表示部の周縁部に、回路基板を係止する係止部が設けられたことを特徴とする。このような携帯無線装置によれば、液晶表示部と回路基板とを組み立てた状態にして、それらを同時に一方のケースに組み付けることができる。また、液晶表示部及び回路基板を組み付けた状態でそのケースをひっくり返して他の部品の組み付けを行うこともできる。

【0009】本発明に係る請求項10に記載の携帯無線装置は、一対のケースからなる第1の筐体及び第2の筐体と、該第1の筐体及び第2の筐体を互いに回動可能に連結するヒンジ部とを備え、前記第1の筐体と第2の筐体とを前記ヒンジ部を中心に回動させることでそれら第1の筐体及び第2の筐体を折り畳むことが可能であり、前記第1の筐体及び第2の筐体の少なくともいずれかの内部に液晶表示部及び回路基板が装着された折り畳み式の携帯無線装置において、一方のケースの他方のケースに対向する面に前記液晶表示部を囲むように保持ピンが一体成形され、前記液晶表示部の周縁部に、前記保持ピンの立設方向に対してほぼ平行に前記液晶表示部を前記一方のケースへ組み付けることで前記保持ピンと係合された被保持部が設けられていることを特徴とする。この折り畳み式の携帯無線装置によれば、第1の筐体の一方のケースと第2の筐体の一方のケースとをヒンジ部で折れ曲がった状態で連結した状態で部品の組み付けを行う場合にも、それら一方のケース内で液晶表示部が正規の位置からずれることがない。また、液晶表示部を組み付けた状態でそれらケースをひっくり返して他の部品の組み付けを行うこともできる。

【0010】

【発明の実施の形態】以下、本発明に係る携帯無線装置の実施の形態について図面を参照して詳細に説明する。本実施形態においては、携帯無線装置の具体的な一例として折り畳み式携帯電話機を説明することにする。図1は、折り畳み式携帯電話機の全体外観図で（a）は正面図、（b）は側面図であり、図2は折り畳み式携帯電話機の折り畳んだ状態を示す外観斜視図である。

【0011】図1に示すように、折り畳み式携帯電話機100は、筐体が上部筐体（第2の筐体）10及び下部筐体（第1の筐体）20に分割され、これら上部筐体10と下部筐体20とをヒンジ部30により互いに回動可能に連結した構成である。この携帯電話機100の上部筐体10を、ヒンジ部30を中心に回動させることで、上部筐体10が下部筐体20に当接或いは略当接するまで折り畳むことができる。その結果、図2に示すように折り畳められた状態にできる。上部筐体10及び下部筐体20はそれぞれ、表ケースと裏ケースとを組み合わせてなっており、図1（a）における手前側のケース（図1（b）における左側のケース）がそれぞれの表ケースである。

【0012】この携帯電話機100の上部筐体10には、音声等の音を発するレシーバ（スピーカ）を有する受話部12や液晶表示部14が備えられている。下部筐体20には、音声等の音を検出するマイク22を有する送話部28、キー操作部24、バッテリー26等が備えられている。

【0013】下部筐体20のキー操作部24は、携帯電話機100の電源オン／オフ用のスイッチ、英数字・文字入力用のキー、各種の機能を選択・実行するためのファンクションキー等が含まれる。また、キー操作部24の裏面には、比較的重量のあるバッテリー26が着脱自在に取り付けられ、携帯電話機100の重心位置を下部筐体20内に位置させることで把持安定性を得ている。

【0014】また、下部筐体20の一方の側面（図1（a）では左側）には、アンテナ40を収容するアンテナ収容部42が下部筐体20の長手方向に対して略平行に配設されている。このアンテナ40は例えばホイップアンテナであって、伸縮自在に下部筐体20に設けられている。すなわち、アンテナ40は、伸長時に図1に示すように上部筐体10側方に引き出され、使用時における人体頭から離反する方向に向けられる一方、収容時には、図2に示すように先端部40aを残してアンテナ収容部42に納められる。また本実施形態では、図2に示すように、上部筐体10の裏ケース側に第2液晶表示部25が設けられている。

【0015】ここで、上記の携帯電話機100においては、アンテナ40が下部筐体20側に配設されているため、下部筐体20内に収容されている無線回路との接続距離が短くて済み、電力消費を抑えることができるとともに、受信感度を高められる利点を有する。

【0016】図3は、上部筐体の表ケース10a及び下部筐体の表ケース20aを内面側から見た斜視図である。上部筐体の表ケース10aの面方向と下部筐体の表ケース20aの面方向とは平行になっておらず、これら表ケース10a，20aはヒンジ部30で折れ曲がった状態で連結されている。この状態で、各表ケース10a，20aに様々な部品が組み付けられていく。上部筐体の表ケース10a内部には、液晶表示部14、第2液晶表示部25、及びそれら液晶表示部のドライバ回路等を含む副回路基板15、受話部のスピーカ12a等が収容される。液晶表示部14、副回路基板15及び第2液晶表示部25は組み立てられた状態で表ケース10a内に組み付けられる。これらの組立構造については後述する。上部筐体の表ケース10aは、マグネシウム等の金属より形成されている。下部筐体の表ケース20a内部には、各種信号の処理を行うCPUや各種情報を記憶するメモリ等の電子部品が実装されている無線回路を含む主回路基板16、送話部のマイク22等が収容される。下部筐体の表ケース20aは、樹脂より形成されている。副回路基板15と主回路基板16とはフレキシブル基板18を介して接続されており、互いの回路基板間において各種伝送信号の送受がなされている。なお、フレキシブル基板18は、ヒンジ部30の内部を通して回路基板15，16を連結している。

【0017】上部筐体の表ケース10aの内面（裏ケースに対向する面）には、液晶表示部14を囲むように複数の（ここでは3本の）保持ピン11が一体成形されている。保持ピン11は、ここでは表ケース10a内面の長手方向の一辺に沿って互いに間隔を隔てて2本設けられ、長手方向の他辺に1本設けられている。長手方向の他辺に設けられた1本の保持ピン11は、長手方向の一辺に設けられた2本の保持ピン11の中間に位置している。各保持ピン11はここでは略円柱状に形成されており、その先端が、後述する被支持部14bの案内面としての、半球面状にされている。なお、各保持ピン11の先端は、案内面としてのテーパ面等にすることもできる。各保持ピン11の立設方向は、液晶表示部14の組付方向に一致しており、液晶表示部14の組み付けがスムーズに行えるようになっている。

【0018】液晶表示部14は、平面視において略長方形状のホルダ14aに、LCDやバックライトを保持した構造である。ホルダ14aは樹脂から形成されている。ホルダ14aの周縁部の一部である長辺は、表ケース10aの長手方向に沿って延びている。その長辺の、保持ピン11に対応する所定箇所に、被支持部14bが設けられている。すなわち、ホルダ14aの一方の長辺（図では手前側の長辺）には2個の被支持部14bが互いに間隔を隔てて設けられ、他方の長辺には1個の被支持部14bが設けられている。各被支持部14bは、ホ

ルダ１４ａに一体成形されている。

【００１９】各被支持部１４ｂは、背板の両側から側板を立ち上げた略コ字状に形成され、それぞれの背板がホルダ１４ａに接続されている。各被支持部１４ｂの側板は、ホルダ１４ａの長辺の外壁から突出している。各被支持部１４ｂは、保持ピン１１の軸方向に沿って見た状態で略コ字状であって、保持ピン１１の外周面の一部を囲む形状であるといえる。なお、各被支持部１４ｂは、樹脂をこのような形状にしたことから、所定の弾性を有している。

【００２０】図４に示すように、液晶表示部１４の被支持部１４ｂの内面（一方の側板の内面、背板の内面及び他方の側板の内面）は、円柱状の保持ピン１１（図３参照）の外周面を把持可能な滑らかな湾曲面に形成されている。さらに、液晶表示部１４のホルダ１４ａは、副回路基板１５の周縁部所定箇所を係止する係止爪１４ｃを両長辺に備えている。またホルダ１４ａの両長辺には、後述する第２液晶表示部２５の係止爪２５ｃが干渉することを防ぐために凹部１４ｄが設けられている。液晶表示部１４の副回路基板１５に対向する面の所定箇所には、副回路基板１５に嵌挿される位置決めピン１４ｅが設けられている。

【００２１】第２液晶表示部２５のホルダ２５ａも、副回路基板１５の周縁部所定箇所を係止する係止爪２５ｃを両長辺に備えている。ホルダ２５ａの短辺には、副回路基板１５に嵌挿される位置決めピン２５ｅが設けられている。副回路基板１５を、液晶表示部１４の係止爪１４ｃで係止するとともに、第２液晶表示部２５の係止爪２５ｃで係止することで、液晶表示部１４、副回路基板１５及び第２液晶表示部２５が組み立てられた状態となる。このとき、第２液晶表示部２５の係止爪２５ｃは、液晶表示部１４の凹部１４ｄに嵌合する。

【００２２】こうして組み立てた液晶表示部１４、副回路基板１５及び第２液晶表示部２５は、図３に示すように、保持ピン１１の立設方向に対してほぼ平行に移動されて、表ケース１０ａに同時に組み付けられる。このとき、保持ピン１１の外周面の一部と、被支持部１４ｂの内面とが摺接する。詳しくは、保持ピン１１によって被支持部１４ｂの側板間を若干広げるように弾性変形させつつ、保持ピン１１が被支持部１４ｂに差し込まれる。なおこの組付作業には、大きな外力は必要とされない。こうして液晶表示部１４、副回路基板１５及び第２液晶表示部２５は、表ケース１０ａに仮固定される。この仮固定状態では、表ケース１０ａをひっくり返しても、液晶表示部１４、副回路基板１５及び第２液晶表示部２５が表ケース１０ａから外れたり、表ケース１０ａ内でずれたりしない。

【００２３】以上のような構成の折り畳み式携帯電話機１００によれば、液晶表示部１４の被支持部１４ｂが、保持ピン１１の立設方向に対してほぼ平行に液晶表示部

１４を表ケース１０ａへ組み付けることで、その被支持部１４ｂと保持ピン１１とを係合させられる形状になっているため、この組付作業は容易で、この組付作業の自動化も行い易い。そして、上部筐体１０の表ケース１０ａと裏ケースとを組み合わせる前から、液晶表示部１４、副回路基板１５及び第２液晶表示部２５を表ケース１０ａに仮固定できる。したがって、表ケース１０ａにこれらの液晶表示部１４、副回路基板１５及び第２液晶表示部２５を組み付けた後の、他の部品の組み付けを行い易く、これら他の部品の組付作業も自動化し易い。

【００２４】また、保持リブ１１が略円柱状であるため、上部筐体１０の表ケース１０ａが金属から成形されているにも拘わらず、その表ケース１０ａに保持リブ１１を容易に設けることができる。

【００２５】なお、本発明は前述した実施形態に限定されるものではなく、適宜な変形、改良等が可能である。例えば、保持ピンが備えられる一方のケースの材質が樹脂のものにも、本発明は有効である。例えば、保持ピンは壁状（リブ状）であってもよい。例えば、被支持部はリング状であってもよい。

【００２６】

【発明の効果】以上説明したように、本発明によれば、筐体の成形煩雑化を招くことなく、液晶表示部や回路基板を一方の筐体内にしっかりと保持できる。また、部品組付作業の自動化も行い易い。

【図面の簡単な説明】

【図１】折り畳み式携帯電話機の全体外観図で（ａ）は正面図、（ｂ）は側面図である。

【図２】折り畳み式携帯電話機の折り畳んだ状態を示す外観斜視図である。

【図３】上部筐体及び下部筐体の表ケースの内面側斜視図である。

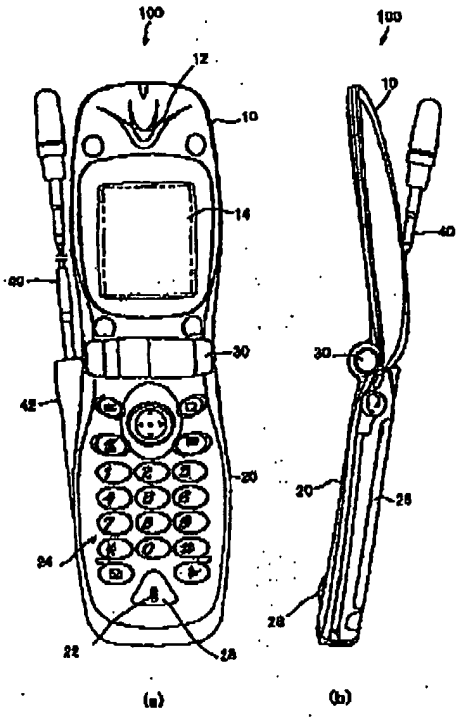
【図４】液晶表示部、副回路基板及び第２液晶表示部の組立構造を説明する分解斜視図である。

【図５】従来の液晶表示部保持構造の分解斜視図である。

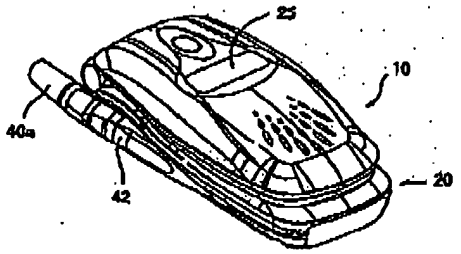
【符号の説明】

１００	折り畳み式携帯電話機（携帯無線装置）
１０	上部筐体
１０ａ	表ケース（一方のケース）
１１	保持ピン
１４	液晶表示部
１４ａ	ホルダ
１４ｂ	被支持部
１４ｃ	係止爪（係止部）
１５	副回路基板（回路基板）
２０	下部筐体
２０ａ	表ケース（一方のケース）
２５	第２液晶表示部

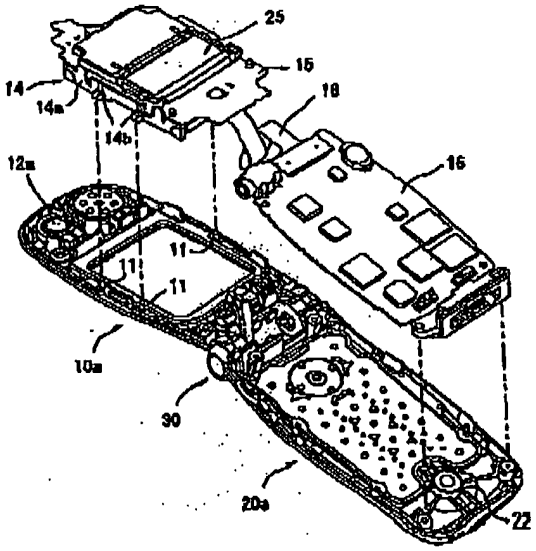
【図1】


100
12
10
14
40
30
42
20
24
22
18
(a)
100
10
40
30
20
28
(b)

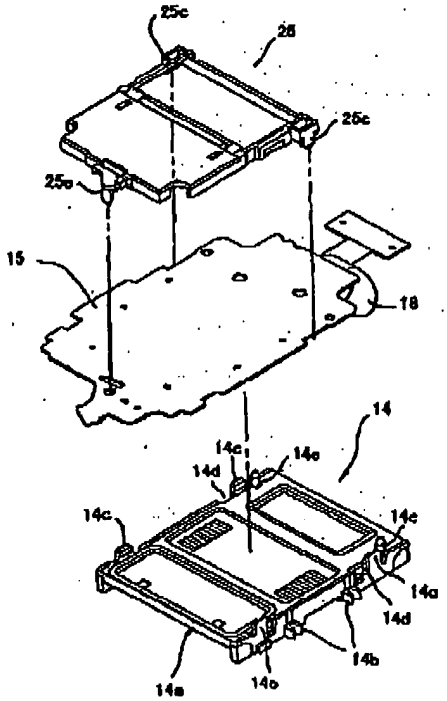
【図2】


25
10
40a
42
20

【図3】


25
15
14
14a
14b
18
12a
16
11
11
11
10a
30
20a
22

【図4】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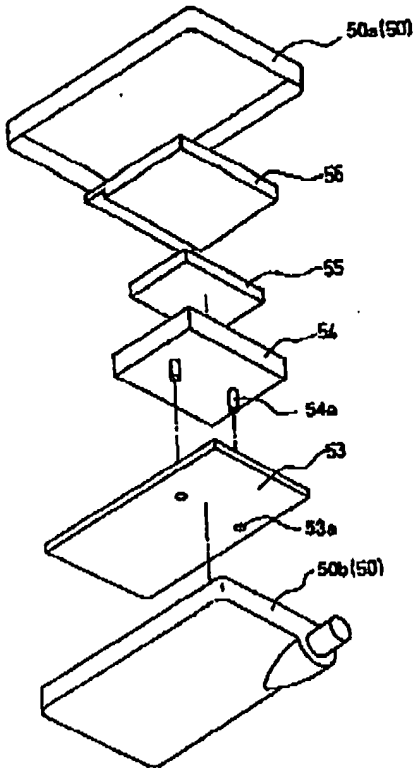
28
25c
25a
15
18
14
14c
14d
14e
14c
14e
14a
14d
14b
14a
14c

【図5】



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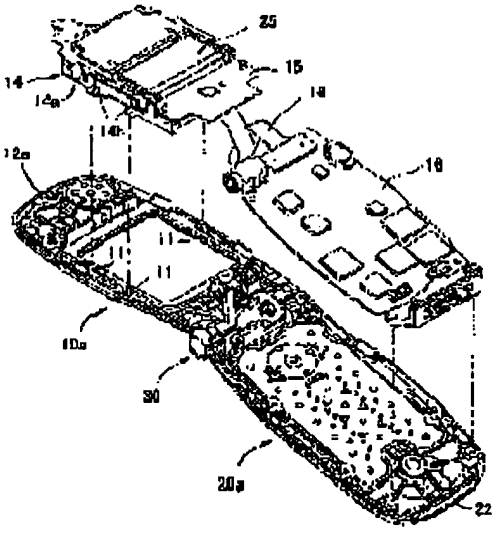
(54) PORTABLE RADIO EQUIPMENT

(57)Abstract:
PROBLEM TO BE SOLVED: To provide portable radio equipment, capable of tightly retaining a substrate or a liquid crystal display part in one case body, without generating the molding complicated for the case body.
SOLUTION: Holding pins 11 are integrally molded on the face of one case 10a opposite to the other case, so that a liquid crystal display part 14 is surrounded ; and parts 14b to be held are formed at the peripheral edge part of the liquid crystal display part 14, so as to be engaged with the holding pins 11, by imposing the liquid crystal display part 14 on the other case 10a, almost in parallel with respect to the erected directions of the holding pins 11.



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TECHNICAL PROBLEM [Problem(s) to be Solved by the Invention] A substrate 53 and the liquid crystal display section were not fixed to table case 50a or flesh-side case 50b until conventional walkie-talkie equipment combined table case 50a and flesh-side case 50b. Therefore, in the production process, when attaching a substrate 53, the liquid crystal display section, and other component parts to the flesh-side case 50b, conveying flesh-side case 50b, a substrate 53 and the liquid crystal display section might shift from the location of normal within flesh-side case 50b. Moreover, **** repetition ****** was not able to be attached for flesh-side case 50b. Moreover, although attachment of components is carried out to these tables case in the production process of the walkie-talkie equipment of a fold-up formula, conveying where the table case of an up case and the table case of a lower case are connected through a hinge region When the table case of an up case and the table case of a lower case are connected in the condition of having bent by the hinge region, the stability of these tables case on a conveyance base is bad, and a substrate and the liquid crystal display section especially become easy to shift from the location of normal. Moreover, although a case may be formed with a metal for the purpose of the improvement in on the strength of a case etc., it was difficult to really fabricate the thing of a configuration with a complicated stop pawl etc. to a case in this case for maintenance of the liquid crystal display section. This invention is made in view of the above-mentioned situation, and the object is in offering the walkie-talkie equipment which can hold a substrate and the liquid crystal display section firmly in one case, without causing shaping complicated-ization of a case.

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TECHNICAL FIELD [Field of the Invention] This invention relates to walkie-talkie equipment equipped with the liquid crystal display section.

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PRIOR ART [Description of the Prior Art] In recent years, various development of the small walkie-talkie equipments, such as a portable telephone, is carried out. The portable telephone is equipped with the liquid crystal display section and the substrate 53 which are constituted from a holder 54, a light guide plate 55, and liquid crystal display (LCD) 56 grade by the case 50 interior which consists of table case 50a and flesh-side case 50b as an outline configuration, as shown in drawing 5 . A holder 54 is fixed to a substrate 53 by fitting pin 54a which protruded on the substrate 53 side in hole 53a prepared in the substrate 53. Furthermore, fixed maintenance of LCD56 is carried out through the light guide plate 55 which carries out the light guide of the back light to LCD56 to this holder 54. When the screw stop of the substrate 53 is carried out combining table case 50a and flesh-side case 50b, it is fixed in a case 50.
[0003] Moreover, as walkie-talkie equipment, a case is divided into the upper part and the lower part, and it constitutes possible [folding], and what made hold to a pocket or a bag easy is developed, securing the operability at the time of transmission and reception.

[Translation done.]
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EFFECT OF THE INVENTION [Effect of the Invention] The liquid crystal display section and the circuit board can be firmly held in one case, without causing shaping complicated-ization of a case according to this invention, as explained above. Moreover, it is easy to perform automation of an activity with a components group.

[Translation done.]

* NOTICES *

DETAILED DESCRIPTION [Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to walkie-talkie equipment equipped with the liquid crystal display section.
[0002]
[Description of the Prior Art] In recent years, various development of the small walkie-talkie equipments, such as a portable telephone, is carried out. The portable telephone is equipped with the liquid crystal display section and the substrate 53 which are constituted from a holder 54, a light guide plate 55, and liquid crystal display (LCD) 56 grade by the case 50 interior which consists of table case 50a and flesh-side case 50b as an outline configuration, as shown in drawing 5 . A holder 54 is fixed to a substrate 53 by fitting pin 54a which protruded on the substrate 53 side in hole 53a prepared in the substrate 53. Furthermore, fixed maintenance of LCD56 is carried out through the light guide plate 55 which carries out the light guide of the back light to LCD56 to this holder 54. When the screw stop of the substrate 53 is carried out combining table case 50a and flesh-side case 50b, it is fixed in a case 50.
[0003] Moreover, as walkie-talkie equipment, a case is divided into the upper part and the lower part, and it constitutes possible [folding], and what made hold to a pocket or a bag easy is developed, securing the operability at the time of transmission and reception.
[0004]
[Problem(s) to be Solved by the Invention] A substrate 53 and the liquid crystal display section were not fixed to table case 50a or flesh-side case 50b until conventional walkie-talkie equipment combined table case 50a and flesh-side case 50b. Therefore, in the production process, when attaching a substrate 53, the liquid crystal display section, and other component parts to the flesh-side case 50b, conveying flesh-side case 50b, a substrate 53 and the liquid crystal display section might shift from the location of normal within flesh-side case 50b. Moreover, **** repetition ****** was not able to be attached for flesh-side case 50b. Moreover, although attachment of components is carried out to these tables case in the production process of the walkie-talkie equipment of a fold-up formula, conveying where the table case of an up case and the table case of a lower case are connected through a hinge region When the table case of an up case and the table case of a lower case are connected in the condition of having bent by the hinge region, the stability of these tables case on a conveyance base is bad, and a substrate and the liquid crystal display section especially become easy to shift from the location of normal. Moreover, although a case may be formed with a metal for the purpose of the improvement in on the strength of a case etc., it was difficult to really fabricate the thing of a configuration with a complicated stop pawl etc. to a case in this case for maintenance of the liquid crystal display section. This invention is made in view of the above-mentioned situation, and the object is in offering the walkie-talkie equipment which can hold a substrate and the liquid crystal display

section firmly in one case, without causing shaping complicated-ization of a case.
[0005]
[Means for Solving the Problcm] In the walkie-talkie equipment equipped with the attachment component which the walkie-talkie equipment according to claim 1 concerning this invention consists of a case case of a couple for the above-mentioned object achievement, and holds electronic parts in said case case, it is characterized by to hold one of said case case, when the retaining pin holding an attachment component really fabricates, attaches said attachment component to abbreviation parallel to said case case to the set-up direction of said retaining pin and engages with said retaining pin. Moreover, the walkie-talkie equipment according to claim 4 concerning this invention In the walkie-talkie equipment with which the interior of the case which consists of a case of a couple was equipped with the liquid crystal display section A retaining pin is really fabricated so that said liquid crystal display section may be surrounded to the field which counters the case of another side of one case. It is characterized by preparing the attaching part-ed which engaged with said retaining pin by attaching said liquid crystal display section to the periphery section of said liquid crystal display section to one [said] case mostly to the set-up direction of said rctaining pin at parallel. With this walkie-talkie equipment, before combining one case and the case of another side, immobilization thru/or thc temporary immobilization of the liquid crystal display section can be carried out at one case. Therefore, in a production process, in case the liquid crystal display section, thc circuit board, and other component parts are attached to the case, conveying one case, the liquid crystal display section does not shift from the location of normal within the case. Moreover, since the supported part is the configuration which engages with a retaining pin by attaching the liquid crystal display section to parallel to one case mostly to the set-up direction of a retaining pin, it is easy to automate the activity with a group to one case of the liquid crystal display section. Furthermore, where the liquid crystal display section is attached, it also becomes possible about the case to attach components besides **********. A cylinder-like thing etc. can be illustrated although the gestalt of a retaining pin is not limited. Also when such a retaining pin can bc prepared in a case easily [while], for example, one case is formed from ingredients with comparatively difficult shaping, such as a metal, a retaining pin can be easily prepared in the case of one of these.
[0006] It is characterized by forming one case from a metal in the above-mentioned configuration at claims 2 and 5 concerning this invention, as for the walkie-talkie equipment of a publication. It is characterized by forming one case from magnesium in the above-mentioned configuration at claims 3 and 6 concerning this invention, as for the walkie-talkie equipment of a publication. According to such walkie-talkie equipment, the endurance of walkie-talkic equipment can be raised by raising the reinforcement of a case. Moreover, thin-shape-izing and lightweight-izing of walkie-talkie equipment are also realizable by using magnesium.
[0007] The walkie-talkie equipment according to claim 7 concerning this invention is characterized by stopping the liquid crystal display section in one case according to the elastic repulsive force which an attaching part-ed produces by engagement to a retaining pin in the above-mentioned configuration. Moreover, the walkie-talkie equipment according to claim 8 concerning this invention is characterized by being formed in the configuration in which an attaching part-ed surrounds a part of pcriphery [at least] of a retaining pin in the above-mentioned configuration. According to such walkie-talkie equipment, by having given elasticity to the attaching part-ed, whilc being able to perform easily attachment by one case of

the liquid crystal display section, the once attached liquid crystal display section cannot separate from the case, or it does not shift from the location of normal within the case, and the liquid crystal display section can be firmly held in the case.

[0008] The walkie-talkie equipment according to claim 9 concerning this invention is characterized by preparing the stop section which stops the circuit board in the periphery section of the liquid crystal display section in the above-mentioned configuration. According to such walkie-talkie equipment, it can change into the condition of having assembled the liquid crystal display section and the circuit board, and they can be attached to a case simultaneous [while]. Moreover, where the liquid crystal display section and the circuit board are attached, components besides ********** can also be attached for the case.

[0009] The walkie-talkie equipment according to claim 10 concerning this invention It has the hinge region which connects the 1st case and the 2nd case which consist of a case of a couple, and the this 1st case and 2nd case of each other rotatable. It is possible to fold up these 1st cases and the 2nd case by rotating said the 1st case and 2nd case focusing on said hinge region. In the walkie-talkie equipment of a fold-up formula of said 1st case and the 2nd case with which the interior of either was equipped with the liquid crystal display section and the circuit board at least A retaining pin is really fabricated so that said liquid crystal display section may be surrounded to the field which counters the case of another side of one case. It is characterized by preparing the attaching part-ed which engaged with said retaining pin by attaching said liquid crystal display section to the periphery section of said liquid crystal display section to one [said] case mostly to the set-up direction of said retaining pin at parallel. Where one case of the 1st case and one case of the 2nd case are connected in the condition of having bent by the hinge region, also when attaching components according to this folding-type walkie-talkie equipment, the liquid crystal display section does not shift from the location of normal within one [these] case. Moreover, where the liquid crystal display section is attached, components besides ********** can also be attached for these cases.

[0010]

[Embodiment of the Invention] Hereafter, the gestalt of operation of the walkie-talkie equipment concerning this invention is explained to a detail with reference to a drawing. In this operation gestalt, it will fold up as a concrete example of walkie-talkie equipment, and a formula portable telephone will be explained. Drawing 1 is [a front view and (b) of (a)] side elevations in the whole fold-up formula portable telephone external view, and drawing 2 is the appearance perspective view showing the condition that the fold-up formula portable telephone folded up.

[0011] As shown in drawing 1, the fold-up formula portable telephone 100 is the configuration which the case was divided into the up case (the 2nd case) 10 and the lower case (the 1st case) 20, and connected these up case 10 and the lower case 20 of each other rotatable by the hinge region 30. By rotating the up case 10 of this portable telephone 100 focusing on a hinge region 30, it is foldable until the up case 10 contacts or contacts [abbreviation] at the lower case 20. Consequently, it changes into the condition that it was foldable as shown in drawing 2 . The up case 10 and the lower case 20 have become combining the table case and the flesh-side case, respectively, and the case (case of the left-hand side in drawing 1 R> 1 (b)) of the near side in drawing 1 (a) is each table case.

[0012] The up case 10 of this portable telephone 100 is equipped with the receiver section 12 and the liquid crystal display section 14 which have the receiver (loudspeaker) which emits sounds, such as voice. The lower case 20 is equipped with the transmission section 28 which has the

microphone 22 which detects sounds, such as voice, the key stroke section 24, and dc-battery 26 grade.

[0013] A function key for the key stroke section 24 of the lower case 20 to choose and perform the switch power-source ON / for off [of a portable telephone 100], the key an alphabetic character and for an alphabetic character input, and various kinds of functions etc. is contained. Moreover, the dc-battery 26 which has weight comparatively was attached in the rear face of the key stroke section 24 free [attachment and detachment], and grasping stability has been acquired in locating the center-of-gravity location of a portable telephone 100 in the lower case 20.

[0014] Moreover, the antenna hold section 42 which holds an antenna 40 in one side face (drawing 1 (a) left-hand side) of the lower case 20 is arranged in abbreviation parallel to the longitudinal direction of the lower case 20. This antenna 40 is a whip antenna and is elastically formed in the lower case 20. That is, an antenna 40 is pulled out by the up case 10 side as shown in drawing 1 at the time of expanding, while being turned in the direction which deserts the body side at the time of an activity, as shown in drawing 2 at the time of hold, leaves point 40a and is dedicated to the antenna hold section 42. Moreover, with this operation gestalt, as shown in drawing 2 , the 2nd liquid crystal display section 25 is formed in the flesh-side case side of the up case 10.

[0015] Here, in the above-mentioned portable telephone 100, since the antenna 40 is arranged in the lower case 20 side, while connection distance with the wireless circuit held in the lower case 20 is short, ending and being able to hold down power consumption, it has the advantage which has receiving sensibility raised.

[0016] Drawing 3 is the perspective view which looked at table case 10a of an up case, and table case 20a of a lower case from the inner surface side. The direction of a field of table case 10a of an up case and the direction of a field of table case 20a of a lower case are not parallel, but these tables cases 10a and 20a are connected in the condition of having bent by the hinge region 30. In this condition, various components are attached to each table cases 10a and 20a. Loudspeaker 12a including the driver circuit of the liquid crystal display section 14, the 2nd liquid crystal display section 25, and these liquid crystal display section etc. of the subcircuit board 15 and the receiver section etc. is held in the interior of table case 10a of an up case. The liquid crystal display section 14, the subcircuit board 15, and the 2nd liquid crystal display section 25 are attached in table case 10a in the condition of having been assembled. About these prefabricated frame structures, it mentions later. Table case 10a of an up case is formed from metals, such as magnesium. The microphone 22 grade including the wireless circuit where electronic parts, such as memory which memorizes CPU which processes various signals, and various information, are mounted of the main circuit substrate 16 and the transmission section is held in the interior of table case 20a of a lower case. Table case 20a of a lower case is formed from resin. The subcircuit board 15 and the main circuit substrate 16 are connected through the flexible substrate 18, and transmission and reception of various transmission signals are made between the mutual circuit boards. In addition, the flexible substrate 18 has connected the circuit boards 15 and 16 through the interior of a hinge region 30.

[0017] Two or more retaining pins (here 3) 11 are really fabricated by the inner surface (field which counters a flesh-side case) of table case 10a of an up case so that the liquid crystal display section 14 may be surrounded. A retaining pin 11 separates spacing mutually along with one side of the longitudinal direction of a table case 10a inner surface, is prepared two, and is prepared

one the other sides of a longitudinal direction here. One retaining pin 11 prepared the other sides of a longitudinal direction is located in the medium of two retaining pins 11 established in one side of a longitudinal direction. Each retaining pin 11 is formed in the shape of an approximate circle column here, and is made into the shape of a semi-sphere side as a slideway of supported part 14b which the head mentions later. In addition, the head of each retaining pin 11 can also be made into the taper side as a slideway etc. The set-up direction of each retaining pin 11 can be in agreement with the direction with a group of the liquid crystal display section 14, and can attach now the liquid crystal display section 14 smoothly.

[0018] The liquid crystal display section 14 is the structure which held LCD and a back light to abbreviation rectangle-like holder 14a in plane view. Holder 14a is formed from resin. The long side which is a part of periphery section of holder 14a has extended along with the longitudinal direction of table case 10a. Supported part 14b is prepared in the predetermined part corresponding to the retaining pin 11 of the long side. That is, two supported part 14b separates spacing in one long side (drawing long side of a near side) of holder 14a mutually, and is prepared in it, and one supported part 14b is prepared in the long side of another side. Each supported part 14b is really fabricated by holder 14a.

[0019] Each supported part 14b is formed in the abbreviation U shape which started the side plate from the both sides of the background, and each background is connected to holder 14a. The side plate of each supported part 14b projects from the outer wall of the long side of holder 14a. It can be said that each supported part 14b is an abbreviation U shape in the condition of having seen in accordance with the shaft orientations of a retaining pin 11, and is a configuration surrounding a part of peripheral face of a retaining pin 11. In addition, each supported part 14b has predetermined elasticity from having made resin into such a configuration.

[0020] As shown in drawing 4, the inner surface (the inner surface of one side plate, the inner surface of the background, and inner surface of the side plate of another side) of supported part 14b of the liquid crystal display section 14 is formed in the smooth bow side which can grasp the peripheral face of the cylinder-like retaining pin 11 (refer to drawing 3). Furthermore, holder 14a of the liquid crystal display section 14 equips both long sides with stop pawl 14c which stops the periphery section predetermined part of the subcircuit board 15. Moreover, in order to prevent stop pawl 25c of the 2nd liquid crystal display section 25 mentioned later interfering, 14d of crevices is established in both the long sides of holder 14a. Gage pin 14e fitted in the subcircuit board 15 is prepared in the predetermined part of the field which counters the subcircuit board 15 of the liquid crystal display section 14.

[0021] Holder 25a of the 2nd liquid crystal display section 25 also equips both long sides with stop pawl 25c which stops the periphery section predetermined part of the subcircuit board 15. Gage pin 25e fitted in the subcircuit board 15 is prepared in the shorter side of holder 25a. It will be in the condition that the liquid crystal display section 14, the subcircuit board 15, and the 2nd liquid crystal display section 25 were assembled, by stopping it by stop pawl 25c of the 2nd liquid crystal display section 25, while stopping the subcircuit board 15 by stop pawl 14c of the liquid crystal display section 14. At this time, stop pawl 25c of the 2nd liquid crystal display section 25 fits into 14d of crevices of the liquid crystal display section 14.

[0022] In this way, it is mostly moved to parallel to the set-up direction of a retaining pin 11, and the liquid crystal display section 14, the subcircuit board 15, and the 2nd liquid crystal display section 25 which were assembled are simultaneously attached to table case 10a, as shown in drawing 3 . At this time, a part of peripheral face of a retaining pin 11 and the inner surface of

supported part 14b ****. A retaining pin 11 is inserted in supported part 14b, carrying out elastic deformation in detail, so that between the side plates of supported part 14b may be extended a little with a retaining pin 11. In addition, big external force is not needed for this activity with a group. In this way, temporary immobilization of the liquid crystal display section 14, the subcircuit board 15, and the 2nd liquid crystal display section 25 is carried out at table case 10a. In the state of this temporary immobilization, ********** does not separate from table case 10a from table case 10a, either, or the liquid crystal display section 14, the subcircuit board 15, and the 2nd liquid crystal display section 25 do not shift within table case 10a.

[0023] Since supported part 14b of the liquid crystal display section 14 is the configuration you made [configuration] to be engaged in that supported part 14b and retaining pin 11 by attaching the liquid crystal display section 14 to parallel to table case 10a mostly to the set-up direction of a retaining pin 11 according to the fold-up formula portable telephone 100 of the above configurations, this activity with a group is easy and also tends to perform automation of this activity with a group. And before combining table case 10a of the up case 10, and a flesh-side case, the temporary immobilization of the liquid crystal display section 14, the subcircuit board 15, and the 2nd liquid crystal display section 25 can be carried out at table case 10a. Therefore, it is easy to attach other components after attaching these liquid crystal display sections 14, the subcircuit board 15, and the 2nd liquid crystal display section 25 to table case 10a, and easy to automate the activity with a group of components besides these.

[0024] moreover, the maintenance rib 11 -- an approximate circle -- since it is pillar-shaped, in spite of fabricating table case 10a of the up case 10 from the metal, the maintenance rib 11 can be easily formed in the table case 10a.

[0025] In addition, this invention is not limited to the operation gestalt mentioned above, and proper deformation, amelioration, etc. are possible for it. For example, the construction material of this invention of a case has a retaining pin for while and is effective also in the thing of resin. For example, a retaining pin may be a wall-like (the shape of a rib). For example, a supported part may be a ring-like.

[0026]

[Effect of the Invention] The liquid crystal display section and the circuit board can be firmly held in one case, without causing shaping complicated-ization of a case according to this invention, as explained above. Moreover, it is easy to perform automation of an activity with a components group.

[Translation done.]

* NOTICES *

JPO and NCIPI are not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

CLAIMS [Claim(s)]

[Claim 1] It is walkie-talkie equipment characterized by holding when the retaining pin with which said one case case holds an attachment component in the walkie-talkie equipment equipped with the attachment component which consists of a case case of a couple and holds electronic parts in said case case really fabricates, attaches said attachment component to abbreviation parallel to said case case to the set-up direction of said retaining pin and engages with said retaining pin.

[Claim 2] Walkie-talkie equipment according to claim 1 characterized by forming one [said] case case from a metal.

[Claim 3] Walkie-talkie equipment according to claim 1 characterized by forming one [said] case case from magnesium.

[Claim 4] In the walkie-talkie equipment with which the interior of the case which consists of a case of a couple was equipped with the liquid crystal display section and the circuit board A retaining pin is really fabricated so that said liquid crystal display section may be surrounded to the field which counters the case of another side of one case. Walkie-talkie equipment characterized by preparing the attaching part-ed which engaged with said retaining pin by attaching said liquid crystal display section to the periphery section of said liquid crystal display section to one [said] case mostly to the set-up direction of said retaining pin at parallel.

[Claim 5] Walkie-talkie equipment according to claim 4 characterized by forming one [said] case from a metal.

[Claim 6] Walkie-talkie equipment according to claim 4 characterized by forming one [said] case from magnesium.

[Claim 7] Walkie-talkie equipment according to claim 4 to 6 characterized by stopping said liquid crystal display section in one [said] case according to the elastic repulsive force which said attaching part-ed produces by engagement to said retaining pin.

[Claim 8] Walkie-talkie equipment according to claim 7 characterized by being formed in the configuration in which said attaching part-ed surrounds a part of periphery [at least] of said retaining pin.

[Claim 9] Walkie-talkie equipment according to claim 4 to 8 characterized by preparing the stop section which stops said circuit board in the periphery section of said liquid crystal display section.

[Claim 10] It has the hinge region which connects the 1st case and the 2nd case which consist of a case of a couple, and the this 1st case and 2nd case of each other rotatable. It is possible to fold up these 1st cases and the 2nd case by rotating said the 1st case and 2nd case focusing on said hinge region. In the walkie-talkie equipment of a fold-up formula of said 1st case and the 2nd case with which the interior of either was equipped with the liquid crystal display section and the circuit board at lcast A retaining pin is really fabricated so that said liquid crystal display section may be surrounded to the field which counters the case of another side of one case. Folding-type walkie-talkie equipment characterized by preparing the attaching part-ed which engaged with said retaining pin by attaching said liquid crystal display section to the periphery section of said liquid crystal display section to one [said] case mostly to the set-up direction of said retaining pin at parallel.

[Claim 11] Folding-type walkie-talkic cquipment according to claim 10 characterized by forming one [said] case from a metal.

[Claim 12] Folding-type walkie-talkie equipment according to claim 10 characterized by forming

one [said] case from magnesium.
[Claim 13] Folding-type walkie-talkie equipment according to claim 10 to 12 characterized by stopping said liquid crystal display section in one [said] case according to the elastic repulsive force which said attaching part-ed produces by engagement to said retaining pin.
[Claim 14] Walkie-talkie equipment according to claim 13 characterized by being formed in the configuration in which said attaching part-ed surrounds a part of periphery [at least] of said retaining pin.
[Claim 15] Folding-type walkie-talkie equipment according to claim 10 to 14 characterized by preparing the stop section which stops said circuit board in the periphery section of said liquid crystal display section.

[Translation done.]

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2. claim
(1)
A printed circuit board comprising;

circuit components and a printed wiring board for mounting circuit components,

the printed wiring board being curved concavely and convexly, and the circuit component(s) being mounted on both concave area of the printed wiring board and convex area of the printed wiring board,

the height of circuit components mounted on the concave area from the surface of the printed wiring board being taller than the height of circuit components mounted on the convex area from the surface of the printed wiring board.

(Page 3, line 10-20)

The third figure shows an example of this idea. In the figure 3, (7) indicated the flexible circuit board made from a flexible material such as polyamide or polyester.

This flexible circuit board (7) is curved in the just like figure. The taller circuit components, such as electrolytic capacitors or HIC are mounted on the concave area and the shorter circuit components, such as IC or chips are mounted on the convex area. The printed circuit board being constructed above, the printed circuit board allows the different-height circuit components to be placed efficiently with in a small space. As a result, plural printed circuit board are not necessary.